

CLAIMS

1. A seal mechanism for a fluid machine to prevent a fluid from leaking out of a high-pressure space into a low-pressure space in the fluid machine, said seal mechanism comprising:
 - 5 an annular seal member movable in a radial direction, said annular seal member having a first surface on a side of the low-pressure space in the fluid machine;
 - 10 a housing disposed between a body of the fluid machine and a rotatable member located inside the body of the fluid machine so as to receive said annular seal member, said housing having a second surface facing said first surface of said annular seal member; and
 - 15 at least one passage formed in at least one of said first surface and said second surface.
- 15 2. The seal mechanism as recited in claim 1, wherein said at least one of said first surface and said second surface comprises a flat surface.
- 20 3. The seal mechanism as recited in claim 1, wherein said at least one passage comprises a plurality of passages that do not reach an outer circumferential surface of said annular seal member.
- 25 4. The seal mechanism as recited in claim 3, wherein said plurality of passages do not reach an inner circumferential surface of said annular seal member.
5. The seal mechanism as recited in claim 3 or 4, wherein said plurality of passages include radially arranged passages.
- 30 6. The seal mechanism as recited in claim 3 or 4, wherein said plurality of passages include a passage extending in a circumferential direction.

7. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member is made of metal or synthetic resin.

5 8. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member includes a core covered with synthetic resin.

10 9. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member is formed by molding.

10. A seal mechanism for a fluid machine to prevent a fluid from leaking out of a high-pressure space into a low-pressure space in the fluid machine, said seal mechanism comprising:

15 an annular seal member movable in a radial direction, said annular seal member having at least two first surfaces on a side of the low-pressure space in the fluid machine; and

20 a housing disposed between a body of the fluid machine and a rotatable member located inside the body of the fluid machine so as to receive said annular seal member, said housing having a second surface facing said at least two first surfaces of said annular seal member,

wherein said at least two first surfaces of said annular seal member include: . . .

25 a radially outward surface which is brought into contact with said second surface of said housing over its entire surface; and

a radially inward surface located radially inward of said radially outward surface, said radially outward surface projecting from said radially inward surface toward the low-pressure space in the fluid machine.

11. A centrifugal pump comprising:
a body;
a rotatable shaft;
an impeller rotatable about said rotatable shaft within the body; and
5 said seal mechanism as recited in any one of claims 1 through 10, said seal mechanism being disposed between said body and said impeller.

12. A centrifugal pump comprising:
a body;
10 a rotatable shaft;
an impeller rotatable about said rotatable shaft within the body; and
said seal mechanism as recited in any one of claims 1 through 10, said seal mechanism being disposed between said body and said rotatable shaft.

15 13. A fluid machine comprising:
a body;
a rotatable member disposed within the body; and
said seal mechanism as recited in any one of claims 1 through 10, said seal mechanism being disposed between said body and said rotatable member.

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AMENDED CLAIMS

[received by the International Bureau on 15 April 2005, (15.04.05)
original claims 1 and 10 replaced (2 pages).]

1. (Amended) A seal mechanism for a fluid machine to prevent a fluid from leaking out of a high-pressure space into a low-pressure space in the fluid machine,
5 said seal mechanism comprising:

an annular seal member movable in a radial direction, said annular seal member having a first surface on a side of the low-pressure space in the fluid machine;

10 a housing disposed between a body of the fluid machine and a rotatable member located inside the body of the fluid machine so as to receive said annular seal member, said housing having a second surface facing said first surface of said annular seal member; and

15 at least one passage formed in at least one of said first surface and said second surface such that a negative pressure of the low-pressure space is introduced into said at least one passage to bring said annular seal member into close contact with said second surface of said housing.

2. The seal mechanism as recited in claim 1, wherein said at least one of said first surface and said second surface comprises a flat surface.

20 3. The seal mechanism as recited in claim 1, wherein said at least one passage comprises a plurality of passages that do not reach an outer circumferential surface of said annular seal member.

25 4. The seal mechanism as recited in claim 3, wherein said plurality of passages do not reach an inner circumferential surface of said annular seal member.

5. The seal mechanism as recited in claim 3 or 4, wherein said plurality of passages include radially arranged passages.

30 6. The seal mechanism as recited in claim 3 or 4, wherein said plurality of passages include a passage extending in a circumferential direction.

7. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member is made of metal or synthetic resin.

5 8. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member includes a core covered with synthetic resin.

10 9. The seal mechanism as recited in any one of claims 1 through 6, wherein at least one of said housing and said seal member is formed by molding.

10. (Amended) A seal mechanism for a fluid machine to prevent a fluid from leaking out of a high-pressure space into a low-pressure space in the fluid machine, said seal mechanism comprising:

15 an annular seal member movable in a radial direction, said annular seal member having at least two first surfaces on a side of the low-pressure space in the fluid machine;

20 a housing disposed between a body of the fluid machine and a rotatable member located inside the body of the fluid machine so as to receive said annular seal member, said housing having a second surface facing said at least two first surfaces of said annular seal member; and

25 at least one passage formed in at least one of said at least two first surfaces and said second surface such that a negative pressure of the low-pressure space is introduced into said at least one passage to bring said annular seal member into close contact with said second surface of said housing,

wherein said at least two first surfaces of said annular seal member include:

a radially outward surface which is brought into contact with said second surface of said housing over its entire surface; and

30 a radially inward surface located radially inward of said radially outward surface, said radially outward surface projecting from said radially inward surface toward the low-pressure space in the fluid machine.